

Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Comparative ecology and environmental history (with an emphasis on climate change) of natural and anthropogenic meadows in the Tatra Mountains (Poland and Slovakia) and Rocky Mountains (USA)

Discipline: Natural
Type of Project: Research
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 9/15/2009- 12/31/2012
Funding Amount: 47,770

Investigators and Agency Representative:

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Collaborator: Dr. Mark Fiege, Department of History, CSU

Project Abstract: Meadows are critical ecosystems for supporting biodiversity, hydrologic processes, and producing forage for native and domestic animals. Meadows also provide scenic vistas of landscapes, mountain peaks, and floral displays, and support historic cabins and other structures. Some meadows are natural and created by hydrologic and ecological processes that limit tree establishment and forest development. Other meadows have been created by human activities, including tree cutting, periodic or annual mowing, grazing of domestic livestock, irrigation and burning. Natural and anthropogenic meadows occur in both central Europe and the Rocky Mountains, but little is known about their hydrologic or ecological similarities and differences, or their environmental histories on short or long time scales. These comparisons will be used to provide insights into climate change monitoring.

This proposal is intended to provide financial support for one MS or Ph.D. graduate student from Poland or Slovakia, or a US citizen fluent in either Polish or Slovak to work with us at Colorado State University comparing mountain meadows in the Tatra Mountains and in Rocky Mountain National Park. However, in collaboration with the Key Official, other forms of fulfilling this obligation may be allowed which may include (but not limited to) support for staff development from any of the parks or Colorado State University, hiring a post doc or research assistant, workshops, etc. In addition, travel to Europe may be negotiated if deemed necessary to fulfilling this obligation.

With assistance of the sponsoring countries we may choose 3-4 meadows in each category of natural and anthropogenic for analysis. We would perform library research to investigate the environmental histories of each landscape and meadow, detailed field measurements on water table depth, timing of snow melt, soil water content, soil organic matter content with depth, carbon flux, grazing animal forage utilization, flora and vegetation composition, and current and recent land uses. An elevation gradient of meadows will be characterized from the available literature.

The research above will inform our collective understanding of how each park is mitigating and adapting to climate change. An overview of policies related to climate change will be summarized. A comparative analysis of anticipated consequences (working hypotheses) due to climate change will be provided.

Outcomes with Completion Dates: December 31, 2012: Submit final report to NPS.

Keywords: natural and anthropogenic meadows, ecological history, environmental history, climate change, Tatra Mountains (Poland and Slovakia) Rocky Mountain National Park, Colorado State University